

WORK PLAN for POLARIMETRY

Low Hazard - Skill of The Craft Work for Users

Experiment Number: _____ **Running Period: 2004-2005**

Job Location: RHIC IP 12/AGS C15 - C17/ HTL2 House

Experimental Spokesperson : _____ **Date** _____

Liaison Physicist:
_____ **Date** _____

Liaison Engineer/Work Control Coordinator:
_____ **Date** _____

C-A Approval: _____ **Approval Date** _____
(ESHQ Division Head)

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Skill of the Craft for Polarimetry Users at the ***RHIC and AGS Complex***

1. Introduction

Many of the tasks necessary to maintain, repair, and debug the *Polarimeters* will be carried out by Physicists (Ph.D. and graduate students). Much of this work is deemed to be within the “skill of the craft” for physicists, and as such does not require additional work planning or work permits. The purpose of this document is to define which sorts of tasks fall within this “skill of the craft” for physicists.

The following requirements apply to all personnel working at the experiment:

- No one person is allowed to work alone in the tunnel (two person rule) without informing the Shift Leader or Polarimeter Liaison Physicist.
- All work will be performed by authorized and appropriately trained personnel listed on a published roster maintained by the experiment.
- If tasks are not listed as “skill of the craft”, consultation is required with a Work Control Coordinator and/or Liaison Physicist, to evaluate the task.
- Tunnel Access is allowable for only those who have completed the training requirements listed in this document. To enter during Controlled Access periods persons must be on the Main Control Room Access List.

1. Training

Training shall be required for all participants in the Polarimeter operations

- Collider-Accelerator Access Training (AD-CA_ACCESS)
- Radiation Worker I (HP-RWT-150C)
- Electrical Safety I (TQ-EIECSAF1)
- Lock Out/Tag Out Authorized Employee Training (HP-OSH-151B-W)
- Lock Out / Tag Out On the Job Training (Contact Tony Curcio x)
- Hazard Communication (HP-IND 200)
- Guest Site Orientation (TQ-GSO)
- Cyber Security (GE-CYBERSEC)

2. Electrical

Work on electrical devices is deemed skill of the craft if:

- **Voltage is < 50 V AC (or DC); AND maximum current is < 10 mA**
OR stored energy is < 10 Joules.

ALL ELECTRICAL WORK AT BNL MUST MEET THE REQUIREMENTS OF NFPA-70E

Examples of tasks allowed under this definition include:

- removing and replacing electronic modules in crates such as VME, NIM, FastBus, CAMAC , and similar crates.

- connecting and disconnecting front panel cables (lemo, BNC, etc.) from electronics modules.
- Instruments, detectors, and data acquisition systems may be tested and analyzed using conventional diagnostic equipment such as digital multimeters, oscilloscopes, network analyzers, etc.
- using a multimeter to measure voltages on typical PMT supplies (N.B. typical maximum currents for PMT supplies are ~2.5 mA).
using logic analyzers to debug circuit boards.
- using multimeters to check various currents and voltages on circuit boards.
- Using a computer (connecting and disconnecting computer to electrical outlet, connecting and disconnecting peripheral equipment to computer, turning on and off, etc.).

Examples of tasks which are not allowed under this definition include:

- Working with 110, 208, or 480 V AC line power sources.
- The operation of 110 VAC circuit breakers or switches. Operation of these devices require Personnel Protective equipment such as safety glasses, long sleeve shirts and long pants made of natural fibers.
- Working with exposed leads from the TPC Low voltage power supplies exceeding above limits.
- Measuring the output of the PMT High Voltage supply with a hand held multimeter if exceeding above stated limits.
- Any work on magnet DC power buss or buss covers.

3. Mechanical

Movement of mechanical equipment around the complex is allowed if:

- **No objects greater than 50 kg are to be lifted by hand**
- **The lifting of objects greater than 20 kg is done by two persons**

Examples of tasks allowed under this definition include:

- moving computers around the facility
- removing crates from electronics racks (once they have been electrically disconnected)
- carrying diagnostic equipment (multimeters, oscilloscopes, logic analyzers, etc.) around the facility.
- Use of portable mechanical lift (i.e. foot operated lift for installing LV power supplies with proper training.

Examples of tasks not allowed under this definition:

- operation of building cranes unless properly trained.
- operation of forklift.
- use of rigging equipment (e.g. come-alongs, etc.) without proper training.
- use of bench mounted power tools without proper training.

Only safety rated ladders (use of wooden ladders are prohibited at C-A) are to be used, and a second person must be present for working on a ladder at heights above 1.2 meters (4 feet) or must be present during tie off and untie off procedure.

4. Waste Management

All waste materials generated shall be properly disposed of as per C-A Department's and Laboratory's requirements.

- Report all spills or releases of any potentially activated or hazardous materials immediately to the MCR and C-A ESHQ Division Head.
- disposition of test components, assemblies, and peripheral equipment associated with the experiment are the responsibility of the experimental collaboration.
- The C-A Environmental Coordinator (Joel Scott x 7520) can be consulted in the removal of waste.

5. Emergency Response

The designated Shift Leader shall be responsible for communicating emergency conditions and alarms to C-A support personnel as well as to Laboratory Emergency Services.

- The Shift Leader shall be familiar with C-A OPM 3.0. as well as experiment specific safety procedures.
- Experimental shift personnel shall be trained in the experiment's Standard Operating Procedures (SOPs) for emergency response.
- SOPs shall be available to all experimental personnel.

6. Radiological Work

- All workers in radiological areas shall have appropriate laboratory and Department training.
- Adjacent CONTAMINATION AREAS will be marked with rope and signs. Do not go past these radiation barriers. You are required to have additional training to enter these areas.
- Do not remove any devices or materials that may be activated without HP's inspection and approval.
- DO NOT disregard or defeat any radiation barrier. If you do disciplinary action will be taken against all offenders.

7. Waste Management

All waste materials generated shall be properly disposed of as per C-A Department's and Laboratory's requirements.

- Report all spills or releases of any potentially activated or hazardous materials immediately to the CAS Watch (pager 4205) and C-A ESHQ Division Head (pager 4820).
- Ultimate disposition of test components, assemblies, and peripheral equipment associated with the experiment are the responsibility of the experimental collaboration.
- The C-A Environmental Coordinator (Joel Scott x 7520) can be consulted in the removal of waste.

8. Work other than skill of the craft for a physicist

Any tasks which do not fall within the definitions given above for skill of the craft either:

- Require approved procedures, and the individual(s) performing the task have been trained, and are documented as trained, in the procedure.
- Require further work planning by the Work Control Coordinator.

Examples of tasks which require further work planning are:

- modifications to facility compressed gas or water systems
- Installation, modification, or upgrade of new or existing detector systems.
- Installation of electrical cabling, except as required in trouble shooting and short term repair as covered under this document.

Experimental Shift Leader : (name listed and posted in Experimental Counting House)

Experimental Spokesperson:

Liaison Physicist: Haixin Huang

Liaison Engineer- Work Control Coordinator: